Summary

Paris Agreement has become effective, and Japan also ratified to commit to the agreement. It is important both to deploy renewables and efficiency improvement measures. Also, it is important to make the change earlier since we will use up our carbon budget if we wait for natural replacements.

In Japan, building standards for newly built buildings have been consolidated, however, no effective policy measures against existing buildings and homes has been implemented yet.

The Center for Low Carbon Society Strategy (LCS), Matsuhashi Laboratory and Yoshida Laboratory of the University of Tokyo, and Platinum Society Network has formulated a joint project to induce more energy efficiency improvement in household and small business sectors. We have suggested a policy of "Pay-As-You-Save" scheme for Japan, which targets to include electric appliances which has not been included in Green Deal in UK, and PACE (Property Assessed Clean Energy) scheme. The idea is to allow households and small businesses to implement appliances without initial cost, and monthly repayment will be paid by the electricity fee saved through replacing old appliances to the new and efficient ones. We have conducted a research to review similar policy scheme or business scheme inside and outside Japan, and designed the social experiments with our partners in 3 sites. These are, 1) Household refrigerators replacement with Shizuoka Gas Company, 2) Household refrigerators replacement with Shimokawa Town (in Hokkaido Prefecture), 3) Small business's refrigerators replacement with Minamata City (in Kumamoto Prefecture).

We have measured electricity consumption by the refrigerators at homes, and analyzed if it can be paid off within 10 years using our PAYS scheme. Among the households in the project with Shizuoka Gas Company, we have made recommendation to 5 households to replace the refrigerators among 20 households measured, and 2 households has decided to use Shizuoka Gas's PAYS scheme. The households have replaced their old refrigerators without any initial payment, but they repay monthly fee which is equivalent to the estimated saved fee. Their electricity payment for the refrigeration has reduced by more than 60%. In the project with Shimokawa town, 1 household out of 12 households measured, replaced its refrigerator, and achieved around 65% electricity saving. In the project with Minamata city, a small restaurant has replaced its refrigerators using our PAYS scheme.

According to the interview conducted by Shizuoka Gas Company to the households, it was very effective to increase the persuasiveness to see the actual measured data for the electricity consumption by refrigerators. On the other hand, leasing company which has provided the leasing scheme for the household refrigerators, electric appliances are movable, and they see possible higher risks to construct the leasing system for the refrigerators.

Therefore, we consider it is very effective to implement less expensive, but high performance measurement technology which is lately utilized by using AI technologies. There are already several companies implemented measurement appliance to put master power distribution board, and attain very high resolution data, to separate to the electricity used by each appliance. We suggest to have a one-through system that the user will just put the appliance, and install the smartphone application, and all the electricity usage can be seen at the smart phone, and also the suggestion to become more efficient, and the price and recommended financial support would appear.

Another bottle neck can be solved by supporting the risk of non-payment by the public sector, such as national or local government for the sake of transition to low carbon society. When the risk is not easy to estimate at the initial stage, it tends to be set higher, and block the implementation. Support by the government to cover when the risk realize will be a big support to reduce the uncertainty of the business.

We assume old refrigerators older than the age of 15 account for 16 to 20 percent of all household refrigerators in Japan, and have a potential to save 7% of household CO_2 emissions (Scope 1 & 2). Also, we can expect to have economic impact of around 1.8 trillion yen if all refrigerators older than 15 years old are

replaced.

We still have a risk of lower electricity prices in the future, however, efficiency improvement in the household sector by replacing old appliances have a big potential not only for the CO_2 reduction, but also for the economic impact.